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OVERCOMING DIFFICULTIES WITH CRUSTACEA IN FILTER BEDS[1]

By Helman Rosenthal[2]

The Dallas water purification plant receives its water from either of two sources. Elm Fork of the Trinity River is the more common one, but during the last two years we have received about 40 per cent of our raw water from Bachman's Lake, an artificial reservoir holding about 700,000,000 gallons of water. The water from this reservoir, which comes from natural springs and a small drainage area, is nearly always clear. Its turbidity for a long time may be only one part per million. It is comparatively hard, about 150 parts per million, mostly bicarbonate alkalinity. This water is easily treated. However, at times this water carries a small flea about $\frac{1}{32}$ inch long. Although the raw water has only a few, the water reaching the filters is at times full of them. They multiply very rapidly, and at times become so thick as to actually interfere with filtration. Washing the filters is only a temporary relief. Sometimes they even work their way through the filters.

A study of the organism under the microscope showed the following characteristics. It is a long organism which swims on its belly. It has a very active tail, which moves up and down at "high speed." It has long legs, those in front being as long as the body. These legs have about 15 to 18 definite joints and small branches like thorns on a rose twig. The flea seems to accomplish most of its swimming with these legs and tail. It has a sort of opal looking eye, which at times seems to be of a ruby red color. It has about 8 legs, resembling fins of a fish. When the drop, in which the examination was made, was almost gone by evaporation, the organism put up a struggle, and part of its head turned blood red, as if wounded.

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[1] Presented at the Cleveland Convention, June 8, 1921. Discussion is invited and should be sent to the Editor.

[2] Superintendent and Chief Chemist, Water Purification Plant, Dallas, **Texas.**

Its tail resembles that of a fish, the part nearest the body is one narrow unit and it becomes fan shaped with about 10 or 12 ribs. It has a sort of elongated transparent protoplasmic movement from head to tail which terminates in a yellowish brown sack.

Some of these animalculae, which I presume are the females, have a sack hanging right under the tail. This sack contains about a dozen pea shaped cells. Each of these have myriads of nuclei in them. Upon breaking up some of these cells innumerable nuclei spread in all directions. It is undoubtedly a Crustacea organism and is similar to, or perhaps the same as, the *Diaptomus copepoda.*

As stated previously, this organism at times becomes a real nuisance, and a method had to be devised to rid the filters of the pest. Although CuSo4 suggested itself, its use was somewhat expensive, nor was it very desirable. Finally the writer hit on an idea of chlorinating the water just before it goes to the filters. We always chlorinate the water after filtration using about 0.2 to 0.4 part per million of liquid chlorine. We used therefore from 0.5 to 0.7 part per million of liquid chlorine before filtration. About three hours later samples of water from the filters showed the total absence of these organisms.

The writer feared that the strong chlorine solution might harm the biological activity going on within the filters, but the bacterial reduction showed that the fear was groundless.

The total expense was small indeed and considerably less than copper sulfate would have cost and, of course, not in the least objectionable.